

REMARKS

Claims 1-8 are currently pending and are presently under consideration. Claims 1, 2 and 3 have been amended as shown on pages 2-4 of the Reply. Support for these amendments can be found in the specification as filed at page 9 lines 8-12 and page 12 lines 11-13. In addition, the specification and Abstract are amended as shown at pages 2-3 of the Reply. Favorable reconsideration of the subject patent application is respectfully requested in view of the comments herein.

I. Objection to the Specification and Abstract

In the Advisory Action dated February 26, 2007 the specification and Abstract are objected to for minor informalities. Withdrawal of this objection is requested in view of the aforementioned amendments.

II. Rejection of Claims 1 and 3 Under 35 U.S.C. §102(b)

Claims 1 and 3 stand rejected under 35 U.S.C. §102(b) as being anticipated by Vasudev *et al.* (WO 94/17450) or Vasudev *et al.* (US 5,411,824). This rejection should be withdrawn for the following reasons. Vasudev *et al.* does not disclose or suggest an identical invention as set forth in the subject claims.

A single prior art reference anticipates a patent claim only if it *expressly or inherently describes each and every limitation set forth in the patent claim*. *Trintec Industries, Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The *identical invention must be shown in as complete detail as is contained in the ... claim*. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Applicant's claimed subject matter relates to a *mask for a nanoprnt lithographic process*. In particular, claim 1 recites: ***a translucent material that transfers pattern from the mask to a substrate when placed in physical contact with the substrate or when placed against the substrate with a predetermined pressure applied there between; ...an absorbing material deposited upon one or more of the vertical sidewalls so that light incident on an upper surface of the substrate will be absorbed by the absorbing material, resulting in light blocking features***

such that upon the transfer of the pattern, the substrate comprises features which directly correspond to areas of the absorbing material deposited on the vertical sidewalls. The Vasudev *et al.* references do not disclose or suggest these novel features of the invention as claimed.

The two Vasudev *et al.* documents relate to the same subject matter and will again henceforth be discussed together. Vasudev *et al.* relates to a phase shifting mask (PSM) having absorbent sidewalls that reduce edge scattering and thereby improve resolution. (See Abstract of Vasudev *et al.* (WO 94/17450) or Vasudev *et al.* (US 5,411,824)). Accordingly, a PSM structure having absorbing/attenuating side-walls along the shifter region is disclosed in order to improve resolution, linewidth uniformity and depth of focus. The PSM utilizes shifters in which trenches are formed in a quartz substrate to provide the 180° phase shift. Once the trenches are patterned and formed in the quartz, the sidewalls of the trenches are coated with light absorbing material such that the scattering effect at these edges is eliminated due to the absorption of the light at the sidewalls. (See Vasudev *et al.* (US 5,411,824) col. 2 lines 50-65). Thus, Vasudev *et al.* relates to traditional lithographic processes wherein an image is projected and indelibly formed on a silicon structure coated uniformly with a radiation-sensitive film (the resist or lithographic coating). Therefore, the linewidths of the printed image depend on the optical elements. For example, in PSM shown in Fig. 1B of Vasudev *et al.* (US 5,411,824), distortions in linewidths of the printed image are due to distortions from the shifter regions and are the result of edge scattering and “waveguiding” effects described therein. (See Vasudev *et al.* (US 5,411,824) col. 3 line 35 – col. 4 line 10). The optical equipment for such traditional photolithographic processes requires significant capital investment. (See applicants’ specification as filed page 2 lines 11-12).

In contrast, applicants’ claimed subject matter relates to Nanoprint (also known as nanoprint lithography, imprint lithography, nanoimprint or nanoimprint lithography) technologies that provide an alternative in which the capital investment is significantly reduced in part because patterns are exposed through a 1:1 mask in close proximity to the wafer. For example, claim 1 recites: *a translucent material that transfers pattern from the mask to a substrate when placed in physical contact with the substrate or when placed against the substrate with a predetermined pressure applied there between.* Both documents of Vasudev *et*

al. work on a different technology wherein image is projected and printed onto the resist. Imprint lithography, as disclosed and claimed herein, is relatively inexpensive because it avoids costly optics, as well as cumbersome enhancement techniques like phase-shift masks. Capital cost for equipment is far less than typical step-and-scan or scan and repeat systems. Imprint lithography does not depend on optical elements; rather, the line width is determined solely by the mask or mold. (See applicants' specification as filed page 2 lines 13 – 21). In view of at least the aforementioned, it is not only clear that Vasudev *et al.* fails to teach or suggest *the substrate comprises features which directly correspond to areas of the absorbing material deposited on the vertical sidewalls* as recited in independent claim 1 but that applicants' specification teaches away from the subject matter of Vasudev *et al.*

Accordingly, this rejection of independent claim 1 (and claims that depend there from) should be withdrawn.

III. Rejection of Claim 2 Under 35 U.S.C. §102(b)

Claim 2 stands rejected under 35 U.S.C. §102(b) as being clearly anticipated by either of the Vasudev *et al.* documents in view of Grant *et al.* Reversal of this rejection is respectfully requested for at least the following reasons. Claim 2 depends from independent claim 1. As stated *supra*, neither of the Vasudev *et al.* references disclose nor suggest every aspect set forth in the independent claim 1. Grant *et al.* does not cure the aforementioned deficiencies of the Vasudev *et al.* documents. Therefore, this rejection should be withdrawn.

IV. Rejection of Claims 4 and 8 Under 35 U.S.C. §103(a)

Claims 4 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over either of the Vasudev *et al.* documents in view of Hashimoto (US 5,786,114). Withdrawal of this rejection is requested for at least the following reasons. As stated *supra*, neither of the Vasudev *et al.* documents disclose nor suggest every feature set forth in the subject independent claim 1. Hashimoto also relates to production of phase shift mask which is taught away by applicants' specification. Withdrawal of this rejection is therefore respectfully requested for at least the aforementioned reasons.

V. Rejection of Claim 5 Under 35 U.S.C. §103(a)

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over either of the Vasudev *et al.* documents in view of Takemura (US 5,530,265) or French *et al.* (US 2006/0051974). Withdrawal of this rejection is requested for at least the following reasons. Claim 5 depends from independent claim 1. As stated above, the Vasudev *et al.* documents fail to disclose or suggest every limitation set forth in the subject independent claim. Takemura relates to a thin film transistor or reversed staggered type while French *et al.* relates to manufacturing thin film device arrays. However, neither Takemura nor French *et al.* cure the aforementioned deficiencies of these base references. Therefore, this rejection should be withdrawn.

VI. Rejection of Claim 6 Under 35 U.S.C. §103(a)

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over either of the Vasudev *et al.* documents in view of Aggas *et al.* (US 5,944,157) or Aggas *et al.* (US 6,020,590). Withdrawal of this rejection is requested for at least the following reasons. Claim 6 depends from independent claim 1, and as noted *supra*, the Vasudev *et al.* documents do not disclose or suggest every limitation set forth in the subject independent claim.

It is further submitted that, U.S. 5,944,157 is not by Aggas *et al.* but rather, the inventors named on this patent are Michel Blard and Jacques Thirion De Briel and that the subject matter of this document relates to a completely non-analogous art of friction clutch for a motor vehicle including a wear compensating device. Nowhere does this document teach or suggest that Si or Si-O absorbs UV light as contended on page 11 of the Final Office Action dated December 11, 2006.

The second document, Aggas *et al.* (US 6,020,590), relates to a radiation imager including a TFT (Thin Film Transistor) array. However, it fails to make up for the deficiencies of the Vasudev *et al.* documents with respect to independent claim 1. For at least these reasons, this rejection should be withdrawn.

VII. Rejection of Claim 7 Under 35 U.S.C. §103(a)

Claim 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over either of the Vasudev *et al.* documents in view of Yeh (US 2003/0193068). Withdrawal of this rejection is

requested for at least the following reasons. The Vasudev *et al.* documents fail to disclose or suggest every aspect set forth in the subject independent claim, as discussed *supra*. Yeh relates to fabricating a TFT but fails to cure the aforementioned deficiencies of Vasudev *et al.* with respect to independent claim 1 from which the subject claim depends. Thus, this rejection should be withdrawn.

Conclusion

The subject application is believed to be in condition for allowance in view of the above comments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [AMDP999US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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